



Mechanical Engineering - Daytona Beach

College of Engineering

8-7-2012

Multi-Color Cavity Ringdown Based Detection Method and Apparatus

Scott W. Reeve

Arkansas State University - Main Campus

Susan Davis Allen

Arkansas State University - Main Campus, allens17@erau.edu

Follow this and additional works at: <https://commons.erau.edu/db-mechanical-engineering>



Part of the [Mechanical Engineering Commons](#)

Scholarly Commons Citation

Reeve, S. W., & Allen, S. D. (2012). Multi-Color Cavity Ringdown Based Detection Method and Apparatus. , (). Retrieved from <https://commons.erau.edu/db-mechanical-engineering/16>

This Patent is brought to you for free and open access by the College of Engineering at Scholarly Commons. It has been accepted for inclusion in Mechanical Engineering - Daytona Beach by an authorized administrator of Scholarly Commons. For more information, please contact commons@erau.edu.

(12) **United States Patent**
Reeve et al.

(10) **Patent No.:** **US 8,237,927 B1**
(45) **Date of Patent:** ***Aug. 7, 2012**

(54) **MULTI-COLOR CAVITY RINGDOWN BASED
DETECTION METHOD AND APPARATUS**

(75) Inventors: **Scott W. Reeve**, Jonesboro, AR (US);
Susan Davis Allen, Jonesboro, AR (US)

(73) Assignee: **Arkansas State
University—Jonesboro**, State
University, AR (US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 82 days.

This patent is subject to a terminal dis-
claimer.

(21) Appl. No.: **12/848,816**

(22) Filed: **Aug. 2, 2010**

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/756,876,
filed on Jun. 1, 2007, now Pat. No. 7,768,647.

(60) Provisional application No. 60/803,757, filed on Jun.
2, 2006.

(51) **Int. Cl.**
G01N 21/00 (2006.01)

(52) **U.S. Cl.** **356/437; 356/432**

(58) **Field of Classification Search** 356/432–440;
73/23.3, 23.2, 23.31; 250/227.18, 343, 559.4,
250/345, 339.12–339.13

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,768,647 B2 * 8/2010 Reeve et al. 356/437
2003/0189711 A1 * 10/2003 Orr et al. 356/484
* cited by examiner

Primary Examiner — Tri T Ton

(74) *Attorney, Agent, or Firm* — Joe D. Calhoun; Rashauna
A. Norment

(57) **ABSTRACT**

A multi-color cavity ringdown based spectrometer system is
housed in a light tight enclosure to detect the presence of trace
quantities of gas phase molecules emanating from a subject,
explosives, drugs, or hazardous materials. A method is also
disclosed for simultaneous real time detection of gas phase
molecules emanating from explosives, drugs, hazardous
materials, a subject's breath skin or bodily fluid.

13 Claims, 9 Drawing Sheets

